Scheme of Instruction & Evaluation
and
Detailed Syllabi

(w.e.f the Academic year 2007-08)

POST-GRADUATE DEGREE IN ENVIRONMENTAL PLANNING

DEPARTMENT OF ARCHITECTURE,

ANDHRA UNIVERSITY COLLEGE OF ENGINEERING (AUTONOMOUS), WALTAIR.

INTRODUCTION TO THE COURSE

NEED OF THE COURSE:

The rapid developing city of Visakhapatnam, increasing pressure on existing resources and services – Water supply, Drainage, Power, Transportation etc needs innovative way of tackling and sustainable solutions derived. Also, recent development envisaging Greater Vizag after preparing Visakhapatnam Metropolitan Region, VMR requires planners at large scale to take an initiative for proper development of the city.

Not only at the regional level but also hinterland needs proper planning to make a niche on the eastern coast for a global fame. Developing Industries – large & small scale, (IT, Tourism in particular), Housing – private neighbourhoods, corporate colonies, Services & Infrastructure require quality environmental planners for sustainable, eco-friendly and energy efficient environs.

OBJECT OF THE COURSE:

To prepare sound environmental planning concepts and consultancy as a concern towards nature for sustainability of living beings and the earth.

To mitigate pollution due to inevitable industrial growth for socio-economic development through proper planning.

Ever increasing power demand and declining supply due to limited sources and depleting resources led for alternate and renewable energy sources which have low or no implications on pollution is being envisaged by the course.

SCOPE OF THE COURSE:

The course offers to all its students immense potential in guaranteeing employment in multi-national companies involved in building high class infrastructure, government and non-governmental organizations and self employment as consultants for dynamic entrepreneurs.

Also, the Department of Architecture, AU College of Engineering may involve in consultation for Government/Non-government/Corporate sector in planning from macro level to micro, which also helps the students in having first hand experience of varied projects.

COURSE OUTLINE

The course has been designed as semester wise instruction to the candidates. The course offers comprehensive understanding of issues focused on Urban and its Hinterland with due Environmental consideration for Sustainable development as envisaged in the Objectives.

As a result, it has been felt to carefully delineate the various subjects at different semesters stage-wise, equipping the candidates to become good Environmental Planners.

First semester deals with broad understanding of planning and environment both natural as well as man-made. It also throws light on how to collect data and analyze. Apart from these it equips the student the means & ways of how to make a project viable.

Second semester deals with in-depth understanding of issues relating to Urban & its hinterland in terms of Development activities, Infrastructure and Environment. This is done both by Primary & Secondary (Remote Sensing as a tool) survey analysis.

After having understood the issues, the third semester trains the student to make comprehensive Environmental Management Plan with proper assorting and application of collected and proposed data with Geographic Information System, GIS as a tool.

In the final semester, the course induces the professional out-look of the student and builds confidence in him as he undertakes a Project (live preferably) giving unbiased or rational solutions based on comprehensive understanding of all the previous three semesters acquisition of knowledge.

POST-GRADUATE DEGREE IN ENVIRONMENTAL PLANNING
DEPARTMENT OF ARCHITECTURE,
A.U. COLLEGE OF ENGINEERING, ANDHRA UNIVERSITY, WALTAIR.

Regulations and Syllabus regarding to M. Planning. DEGREE EXAMINATION IN ENVIRONMENTAL PLANNING (Four-Semester Course w.e.f. 2007-08)

1. The Degree of Master of Engineering or Technology/Master of Pharmacy/ Master of Planning will be conferred on a candidate who has satisfied the following conditions:
   i) The candidate must have passed the Bachelor of Architecture or equivalent Bachelor of .Planning /Bachelor of Civil Engineering or Technology Degree in appropriate branch of this University or an examination recognized by this University as equivalent thereto securing not less than 55% marks in aggregate.

      However, candidates who qualified themselves at the GATE examination shall be given priority in admission to M.E./ M.Tech ./M. Pharm./ M. Planning. courses shall be required to appear at a separate entrance test(s) to be conducted by the University in implementing the above regulation, the following guidelines are stipulated.
      (a) Total number of candidates admitted into a course (specialization) with or without GATE sore should not exceed approved sanctioned strength.
      (b) Only after all GATE qualified candidates have been considered for admission, non-GATE candidates may be considered for admission into those courses and under those categories (i.e. SC, ST, BC, etc.) in which vacancies exist.

   ii) After passing B.E / B. Tech / B.Arch / B. Planning./ B. Pharm. degree examination in the appropriate branch of this University or an examination recognized by this University as equivalent thereto, the candidate should have undergone a regular courses of study as hereinafter prescribed, for not less than four semesters (each semester of about 16 weeks duration) and passed the prescribed examination.
   iii) Candidates pursuing the course on a part-time basis (Evening course) should be employed in any recognized local establishment or institution or Government service and shall have a minimum of Two years experience after graduation. The duration of the course for part-time students shall be six semesters.
   iv) Members of the teaching staff of the University college of Engineering and other local engineering colleges may be permitted to undergo the course on a part-time basis (Daytime) and complete

the whole course and examination in not less than six semesters taking two or three papers only in a semester.

NB: Candidates seeking admission to Part-time courses are exempted from passing GATE.

2. The details of qualification necessary for seeking admission into the M. Planning. (Environmental): B. Planning. or B.Arch or B.E. (Civil).

3. "A regular course of study" means attendance is not less than 75% of lectures, practicals, drawing exercises, and field and project work, if any, in each semester in each subject, according to the scheme of instruction.

   Provided that, in special cases for sufficient cause shown, the Vice-Chancellor may, on the recommendation of the Principal, condone the defiency in attendance not exceeding 10% for reasons for ill-health when the application is submitted at the time of the actual illness and is supported by a certificate from an authorized Medical Officer approved by the Principal.

   However, in the case of students, who participate in activities, like N.C.C., Inter-University tournaments, National tournaments, Inter-University debates, N.S.S. and any other activities, deemed genuine by the Head of the Department concerned, the period of their absence for the above purpose can be condoned by the Principal on the recommendation of the Head of the Department.

4. There shall be a written examination at the end of each of the first two/three semesters according to the scheme of examination in the subjects offered in the respective semesters.

   The paper setting for the theory papers shall be by an external examiner and there shall be double valuation. If the disparity between the marks awarded by both examiners is 15% or less, the average mark shall be taken as the marks awarded in the paper. If the disparity happens to be more, reference to a third examiner shall be made and the average of the mark awarded by the two examiners, which are close, shall be taken as mark awarded in the paper. The candidates are required to submit at the end of the fourth semester, three copies (as prescribed)* of the dissertation, project, or thesis on or before a date to be notified by the University from time to time. At the end of the fourth semester there shall be evaluation of the dissertation or project or thesis by a Viva-Voce examination board.

5.

   a) Marks for sessional work shall be allotted by the teaching staff of the college on the basis of class work, mid semester tests, assignments, Viva-Voce, practical work, etc. and the list of marks shall be sent to the Registrar before the commencement of the written examination.

b) Candidates shall satisfy clause 3 for promotion from first semester to second semester and to subsequent semesters.

6. Candidates, who have secured not less than 40% in each theory paper and not less than 50% of the total of maximum marks of the theory paper and sessionals put together, shall be declared to have passed the examination in that subject. In the case of subjects in which no written examination is prescribed, candidates should secure 50% of the marks allotted to each of those subjects. There shall be no provision for improvement of sessional marks in any theory or practical subject in any semester of study.

7. The Viva-Voce examination on the dissertation or project or thesis shall be conducted by a Board of minimum four examiners consisting of,
   i. The Head of the concerned Department as Chairman,
   ii. Chairman, Board of studies of the concerned Department,
   iii. Internal examiner (External to the College).

   Te valuation of the dissertation, project or thesis shall be as provided in the scheme of examination of each course.

8. Candidates who have passed all the subjects of the courses and secured not less than 60% of the aggregate of marks shall be declared to have passed in first class. All the remaining successful candidates shall be declared to have passed in second class.
   Candidates who pass in first class without failure in any of the subjects in the entire course of study and obtain not less than 70% of the marks in the aggregate shall be declared to have passed in first class with distinction.
   However, candidates who have passed all the subjects at first appearance only are eligible for the award of any medals or prizes or rank certificate.

9. Candidates have to complete the M.E., M.Tech., M. Planning., M. Pharm. courses within a maximum period of four years from the date of their admission to the course, failing which they have to seek fresh admission in the course.

** The three copies required above shall be typed on bond paper (8.5"X11" or 215mmX280mm) and properly bound stiff with calico cover, preferably in dark blue and have the year of presentation, title and the candidates name in gold lettering on the spine and on the front cover. Drawings and tables, if any shall be folded and bound into the above size.*

PROPOSED SCHEME OF INSTRUCTION & EVALUATION FOR MASTERS IN ENVIRONMENTAL PLANNING, DEPARTMENT OF ARCHITECTURE, ANDHRA UNIVERSITY

FIRST SEMESTER								
S.No:	SUBJECT		THEORY/ LAB Periods	Credits	MARKS			DURATION OF EXAM
	CODE	NAME			I	E	T	
1	EP11	Introduction to Environmental Planning	4	4	30	70	100	3
2	EP12	Environmental Science	4	3	30	70	100	3
3	EP13	Theories & Techniques for Landuse & Transportation	3	3	30	70	100	3
4	EP14	Statistics & Research Methodologies for Planners	4	3	30	70	100	3
5	EP15	Area Planning Lab/Rural Component Lab	9	7	150	--	150	Viva-voce
			24	20	270	280	550	

SECOND SEMESTER								
S.No:	SUBJECT		THEORY/ LAB Periods	Credits	MARKS			DURATION OF EXAM
	CODE	NAME			I	E	T	
1	EP21	Urban Infrastructure Planning & Management	3	3	30	70	100	3
2	EP22	Remote Sensing & GIS – I	5	4	30	70	100	3
3	EP23	Environmental Impact Assessment	4	4	30	70	100	3
4	EP24	Project Appraisal & Management	4	3	30	70	100	3
5	EP25	EIA Lab/Urban Environmental Lab	8	6	150	--	150	Viva-voce
			24	20	270	280	550	

THIRD SEMESTER								
S.No:	SUBJECT		THEORY/ LAB	Credits	MARKS			DURATION OF EXAM
	CODE	NAME	Periods		I	E	T	
1	EP31	Sustainable Development & Biodiversity Management	4	3	30	70	100	3
2	EP32	Environmental Law & Policy	3	3	30	70	100	3
3	EP33	Remote Sensing & GIS – II	5	4	30	70	100	3
4	EP34	Urban Disaster Management	4	4	30	70	100	3
5	EP35	Environmental Design	8	6	150	--	150	Viva-voce
			24	20	270	280	550	

FOURTH SEMESTER								
S.No:	SUBJECT		THEORY/ LAB	Credits	MARKS			DURATION OF EXAM
	CODE	NAME	Periods		I	E	T	
1	EP41	Professional Practice for Planners	4	4	30	70	100	3
2	EP42	Dissertation/Working Paper	20	10	200	200	400	Viva-voce
			24	14	230	270	500	

* All the surveys for the respective Labs shall be carried out during Sundays & Other Holidays.

RESOURCE PERSONS

1. Faculty from Architecture:
   Sri. G. Viswanadh Kumar – Architectural Conservation, Associate Professor, I/C Head of the department
   Smt. A. Revathi Devi – Urban Design, Associate Professor
   Sri. P. Sudhir Kumar – Environmental Planning will deal most of the subjects.

2. Faculty from Geo-Engg
   Prof.K.Nageswara rao,
   Prof.G.Jai Sahankar

3. Faculty from Civil Engg.
   Prof.B.S.N Raju,
   Prof. S. Ramakrishna Rao,
   Prof. GVR Srinivasa Rao
4. Faculty from Statistics Dept.
5. Faculty from Management School
6. Sri. K. Arunachalam, Former Chief Planning Officer, VUDA
7. Sri. G. Ramduraga Rao, Former Chief Planning Officer, VUDA
8. Sri. PV Krishnajee, consulting Architect – Planner

SEMESTER ONE

EP11 : INTRODUCTION TO ENVIRONMENTAL PLANNING

T/L : 4/wk, Int:30, Ext:70, Total: 100,End Exam: : 3hrs, Cr : 4

Part I : Planning and Environment

Planning, Planning Contexts
Types of Planning
Planning Process and Tools
Definition of Environment
Types of Environment
Population, Resources, Environmental Degradation and Pollution
Pollutants and their effects and control
Environmental Planning – Types

Part II : Physical Environment

1. Air Environment

Air Resources
Atmospheric systems, Climate
Emission standards
Global warning, Ozone depletion, Nuclear Wars, Problems

2. Water Environment

Water Resources – Types
Water Resources – Renewal, Use
Drinking Water Standards, Health Aspects
Water Pollution
Sanitation, Disposal Standards of Treated Wastewater

3. Soil Environment

Soil Types
Soil Yield
Soil Pollution

Part III : Energy

Evaluation of Energy Resources
Types of Energy Sources – Renewable, Conventional and Non-conventional

Part IV : Environmental Policies, Protocols and Regulatory Mechanisms and Concepts of Sustainable Development

Rio Earth Summit, Stockholm conference, Kyoto Protocol
Definition of Sustainable Development
Sustainable Development Capacity
Sustainable Development Concepts
Sustainable Development Indices
Principles of Evaluation and Building of Sustainable Development Capacity

Sustainability of Urban Ecological Environment
Factors Effecting Sustainable Development of Cities
Human Settlement Environment Issues : Hard and Soft

EP 12 : ENVIRONMENTAL SCIENCE

T/L: 4/wk, Int:30, Ext:70, Total: 100,End Exam: : 3hrs, Cr : 3

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1. Basic concepts of Environment, Ecology & Pollution – Principles of ecology, Bio-geo-chemical cycles. Urban, Regional & National Planning.

2. Resources – Water, Land, Mineral – Their importance, conservation and need to protect. Projects related to resources – Degradation during construction and implementation – Protective measures, Conventional & Non-conventional Energy sources.

3. Forests – Advantages – Types of Forests, Forest Management – National parks – Conservation parks – Planning & Development. Green belts – Uses. Models to attenuate pollutants.

4. Wastes – Hazardous & Non-hazardous, Domestic, Hospital, Industrial wastes – Storage – Dumping planning. Composting – Landfills – Vermi-composting. Risk analysis and Management. Natural Hazards – Earthquakes, Cyclones, Tsunamis, Floods – Planning to prevent & Mitigation.

5. Environmental Economics: Environment & Economy – Pollution & Externalities – Common Property Rights – Concept of Total Economic Value – Direct & Indirect Methods of Environmental Valuation – Methods of Pollution Control & Environmental Policy – Sustainable Development – Concept of Green GDP.

EP13: THEORIES AND TECHNIQUES FOR LANDUSE AND TRANSPORTATION PLANNING

T/L : 3/wk, Int:70, Ext:100, Total: 100,End Exam: : 3hrs, Cr : 3

THEORIES AND CONCEPTS : AN OVERVIEW
Introduction

- Concepts
- Urban/Rural
- Settlements and its classification
- Planning

Urban Planning in India – An Overview.
Theories of Planning

- Formative as Positive Theories
- Theories of City Design

Determinants of Land use and Planning Process.

TECHNIQUES

Urban Economics Analysis
(Economic base, input-output, shift share, etc.)
Population studies and forecasting
Land use allocation models
(Lowry/gravity/LP)
Planning norms and standards.
Land Suitability Analysis.

URBAN PLANNING AND DESIGN PRACTICE

Case study presentation (Vidyadhar Nagar, Jaipur)
Case study presentation (Master Plan for Kharghar Node, New Bombay)
Case study Presentation (Master Plan for Cyber city, Hyderabad)

TRANSPORT PLANNING TOPICS

Road Network Classification and Hierarch
Conceptual Approach for Transport in Design practice.
Road Network Planning Principles
Street Management
Traffic Calming
Overview of Transport Planning Process

Problem Solving/Assignment in Class
1. Basics of Traffic Engineering
2. Introduction to Geometric Design of Roads and Junctions

EP14: STATISTICS AND RESEARCH METHODOLOGIES FOR PLANNERS

T/L : 4/wk, Int:30, Ext:70, Total: 100,End Exam: : 3hrs, Cr : 3

Probability: Definitions of probability, Addition theorem, Conditional probability, Multiplication theorem, Bayes theorem of probability and Geometric probability.

Random variables and their properties: Discrete Random variable, Continuous Random variable, Probability Distribution joint probability distributions their properties, Transformation variables, Mathematical expectations, probability generating functions.

Probability Distributions / Discrete distributions: Binomial, Poisson Negative binominal distributions and their properties. (Definition, mean, variance, moment generating function., Additive properties, fitting of the distribution.)

Continuous distributions: Uniform, Normal, exponential distributions and their properties.

Multivariate Analysis: Correlation, correlation coefficient, Rank correlation, Regression Analysis, Multiple Regression, Attributes, coefficient of Association, χ^2 – test for goodness of fit, test for independence, Partial Correlation & Regression.

Estimation: Sample, populations, statistic, parameter, Sampling distribution, standard error, unbiased ness, efficiency, Maximum likelihood estimator, notion & interval estimation.

Testing of Hypothesis: Formulation of Null hypothesis, critic al region, level of significance, power of the test.

Small Sample Tests: Testing equality of .means, testing equality of variances, test of correlation coefficient, test for Regression Coefficient.

Large Sample tests: Tests based on normal distribution

Population Projection: Simple Projection Methods, Composite Projection Methods.

Time Series Analysis

Case studies

Text Books:

Probability & Statistics for Engineers and Scientists,Walpole, Myers, Myers, Ye. Pearson Education.

Probability, Statistics and Random Processes T.Veerarajan Tata McGraw – Hill

Reference Book:

Probability & Statistics with Reliability, Queuing and Computer Applications, Kishor S.

Trivedi, Prentice Hall of India ,1999

EP15: AREA PLANNING LAB

T/L : 9/wk, Int:150, Ext: Nil, Total: 150, and Viva- voce. Cr : 7

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[a] Data Collection and Case Study

In this phase, each group would have to undertake a field visits of the study area. Various data such as demographic and socio-economic, status of physical and social infrastructure, economic activity, etc would have to be collected. On return form the field visits, each group would make a presentation.

[b] Case Study, Site Analysis, Identification of Problems and Design Issues

Each group after through analysis of data collected would be required to describe the existing situation. In addition, after describing the existing situations, the problems therein would be identified and based on which design issues would be identified that would need to be addressed in planning for the area. In addition to these, students will analyze similar case studies and identify design issues and proposed solutions. This phase will terminate in a presentation by each group to a small group of faculty members.

[c] Conceptual Plan

Each group after through analysis of data, identification of the problems and design issues would start work on the conceptual plan for their study area. The proposed concept plan for the study area should contain the following components:

- Objectives and design parameters of the proposed development
- Activity Structure
- Site analysis
- Linkages of the study area with the city
- Physical layout plan indicating the broad land use (residential, commercial, open spaces, industrial, institutional, etc)
- Circulation plan
- Major infrastructure services

The conceptual plan would be presented by each group and will be evaluated by an all faculty jury.

[d] Interim Master Plan

After receiving feedback on the conceptual plan each group would start working towards a master plan for the study area and further refine and substantiate each development proposal with appropriate numbers. The master plan would include the following components:-

- Detailed objectives and activity structure
- Detailed land use plan
- Detailed circulation plan with all levels of roads
- Distribution of open spaces amenities
- Built-form character and urban design guidelines
- Detailed road sections
- Details of two specific projects
- Study models
- Development control regulations
- Preliminary infrastructure plan
- Preliminary costing and financial strategy

This phase will terminate in a presentation by each group to a small group of faculty members.

[e] Final Master Plan With Report and Model

During this phase, the master plan would be further refined in all aspects governing the physical character of the plan followed by the organizational arrangements for development. A phasing plan for the proposed development with supporting financial analysis is required. The lab exercise will terminate after submission of the report and presentation to faculty members and external experts. For the benefit of external jury members, each group will submit an executive summary of their proposal, three days prior to the date of final presentation. Each group along with the final drawings is required to submit a brief report (minimum 30 pages) on their proposals. The chapter outline would mostly follow the phases of stage-2 of the lab exercise.

SEMESTER TWO

EP21: URBAN INFRASTRUCTURE PLANNING AND MANAGEMENT

T/L : 3/wk, Int:30, Ext:70, Total: 100,End Exam: : 3hrs, Cr : 3

General Introduction to Infrastructure development planning and financing issues and emerging options.

- Demand, gap and issues
- Pricing policies
- Private participation
- Emerging options.

Urban Water Supply

- Water Cycle and Water Resources
- Water Balance
- Per capita water supply, norms, need assessment and planning considerations.
- Water quality, Treatment of water
- Storage of Water
- Planning and Design criteria for Distribution
- Block Cost Estimation of W/S Scheme
- Water Losses and Un-accounted for Water

Rain Water Harvesting concept

Harvesting Structures
Roof Top Water Harvesting
Planning and design Implications

Watershed Management

Definition and Concept
Role of micro-level water management committees
Significance of Watersheds in Planning

Drainage and Sanitation

- Basic planning and design criteria, norms, etc.
- Re-use and recycling of waste water.
- Treatment of waste water (conventional)
- Low cost treatment, land based treatment methods
- Septic Tank, Soak Pits

Solid Waste Management:

- Definition and present scenario.
- Physical and chemical compositions, constituents of waste.
- Collection-Storage-Transportation and disposal practices.
- Health and environmental risks and issues.
- Plastic waste and bio-medical waste management.
- Recycling/re-use of wastes.
- Privatisation of Solid Waste Management
- Case Studies

Management of Urban Infrastructure

- Concept of infrastructure asset management
- Role of relational data base management in infrastructure management
  - Concept
  - Rules
  - E-R diagrams

EP22: REMOTE SENSING AND GEOGRAPHIC INFOMRATION SYSTEMS – I

T/L : 5/wk, Int:30, Ext:70, Total: 100,End Exam: : 3hrs, Cr : 4

Introduction to Remote Sensing (RS): Concept of RS; Embarkation of RS; Stages in the Remote Sensing Process; Electromagnetic Spectrum: Concepts; Radiation Interactions; Characteristic of RS; How Remote Sensing Works? Types of Remote Sensing; Advantages of RS; signatures in remote sensing; establishing signature; resolution.

Introduction to Aerial Photography: Definition; Types of AP; stereoscopy; stereovision; conditions and causes for stereo vision; Scale of AP; Stereoscopic appearance; Pocket stereoscope; Mirror stereoscope; Parallax bar; Measurement of Height of the object; geometry of AP; types of projection; mathematical concepts; calculations of scale with different methods.

Aerial photo Analysis: Image displacement; types of image displacement rectification of AP; calculation of relief displacement; of vertical aerial photograph.

Application of Remote Sensing: Role of remote sensing in regional planning and availability from RS; other application; population estimation; transportation network and speed estimation of vehicle on road; computation of photo-scale using following method:

i. Map of known scale
ii. Flight information
iii. Size of an object
iv. Estimation through familiar objects

- On hand exercise on point transfer principal point; flight lines and match lines.

Fundamental of Photo Interpretation: Methods of PI; elements of PI; steps in image interpretation; Advantage of Image Interpretation; Sensors and Sensors platforms Types of platforms; advantage and limitation; photographic camera; filters.

Introduction to Digital Image Interpretation: Remote Sensing data acquisition alternatives–Image processing system; processing system characteristics; software; Digital image data formats band sequential

format; band interleaved by line format; band interleaved by pixel format; run-length encoding format entropy and significance.

Initial Image Statistics extraction: Univariate and multivariate. Statistics computed form remotely sensed imagery; the histogram and its significance to digital image processing of remote sensor data image display alternatives black and white hard copy image. display; video image display; Radiometric correction and geometric correction of remote sensing data (image preprocessing).

Segmentation and edge detection: Basics of edge detection; second-order edge detection; pyramid edge detection; crack edge detection; edge following; crude region detection; region merging; region splitting; sobel detection; crack edge relaxation; simple edge following

Image enhancement: Image reduction and magnification; transects; contrast enhancement; rationing; spatial filtering; edge enhancement; spatial transformations.

EP23: ENVIRONMENTAL IMPACT ASSESSMENT

T/L : 4/wk, Int:30, Ext:70, Total: 100,End Exam: : 3hrs, Cr : 4

Part – I: EIA Concepts and Procedures

Concept of Environment, Concept of EIA
EIA: Origin and Development, Basic Content of EIS
Evolution of EIA in India: Constitutional Provisions and Policy Regulations in India, Institutional arrangement
EIA Evaluation Procedures: Public Hearing
Future Trends in EIA

Part II: Process of EIA

Screening and Scoping
Baseline Studies for EIA
Environmental Settings
Impact Prediction and Evaluation
easurement of Impacts
Concept of Significant Impacts
Impact Mitigation
Comparison of Alternatives
Documentation and Monitoring
EIA Effectiveness, EMP's
Environmental Impact Factors and Areas of Consideration
Environmental Guidelines for Urban Infrastructure Projects

Part III: Socio Economic Impact Analysis

Types of Socioeconomic Impacts
Basic Steps in carrying out socioeconomic impact assessment
Environmental Settings Description
Analysis of Public Services and Facilities
Fiscal Impact Analysis
Analysis of Social Impacts with respect to case study
Impacts of Economic Profile of Community
Prediction and Changes in Socioeconomic Factors

Part IV: Air Quality Impact Analysis

Air Pollutants, Sources of Air Pollution
Effects of Air Pollutants
Air Quality Modelling

Environmental Settings and Description of Project
Meteorology and Air Quality Status
Emission Inventories
Traffic Study, Impact Scenarios
Meso scale Impacts and Micro scale Impacts
Mitigation Measures
Case Studies of a Highway

Part V: Water Quality Impact Analysis

Water Quality Criteria and Standards
Effects of Water Quality
Environmental Settings
Waste load assessment study
Impact Analysis: Modelling, Meso scale and micro scale impacts
Case Studies: Urban Growth, Power Plants

Part VI: Noise and Energy Impact Analysis

Noise and Sound
Analysis of Sound
Sound Propagation and effects of noise on people
Noise Scales and Rating Methods
Estimation of Transportation Noise Impacts
Residential Noise Analysis: Case Study
Energy Overview, Importance of Energy Impact Analysis
Energy Sources and Resources
Energy Impact Assessment

Part VII: Cultural Resources and Biological Impact Analysis

Steps of Prediction and Assessment
Information of Cultural Resources and Identification of Impacts and Procedures
Biological Concepts and Terms
Flora, Fauna Assessments
Radiation Impact on Biota
Case Study

Part VIII: EIA Methodologies

Purpose of EIA Methodologies
Early Developments
Categories of EIA Methodologies
Check List Methods, Quantitative Checklists, Multi Attribute Utility Theory
Matrices Methods, Leopold Matrix, Moore Impact Matrix
Determination of Environmental Impact Importance: Determination of Weightages of Importance, Development of Value Functions
Network Methods

Part IX: People's Participation in EIA and Evaluation Criteria for EIA / EMP Reports

Basic Definitions and Concepts
Advantages and Disadvantages of People's Participation
Objectives of People's Participation
People's Participation Techniques
EIA Reports: Methods of Writing
Basis and Criteria for Evaluation of EIA Reports

Part X: EMP Reports

Introductory Session (Evolution of Pollution Mitigation Technologies, End of Pipe Treatment System Versus Within Pipe Waste Reduction Issues and Options.)

Pollution Control Measures for: Air Pollutants

Domestic Waste Water
Industrial Wastes
Hazardous Wastes.
Solid Wastes

Need of "In-Process Waste Reduction/ Minimisation, Concepts of Cleaner Production and Cleaner Technologies,
Environmentally Sound Technologies
Case Study of a Functional Industrial Estate

Concept of 3-Rs: "Recycle-Reuse and Recovery"
Concepts of Industrial Symbiosis and Ecology
Case Study of Waste Recycling, it's cost effectiveness and options

Environment Management Systems
ISO-14000 and its Planning Implications,
Why do we need ISO?
Case Study of an ISO certified industry, Environmental and Financial Benefits of ISO
Cluster Based Environment management approach
Group Environmental Management System

Principles of Energy
Energy-Environment-Pollution Linkages.,
Energy Demand and Supply Planning Management,
Energy Audit
Conservation Issues

EP24: PROJECT APPRAISAL AND MANAGEMENT

T/L : 4/wk, Int:30, Ext:70, Total: 100,End Exam: : 3hrs, Cr : 3

INTRODUCTION

PROJECT DEFINITION AND PROJECT DIMENSIONS

PROJECT LIFE CYCLE AND STAGES IN PROJECT DEVELOPMENT

- Identification
- Approval
- Clearances
- Implementation
- Operation
- Evaluation

CONSULTANCY SERVICES IN PLANNNING

- Definition and Dimensions
- Stages in Consultancy
- Tendering, Bidding and Evaluation of Consultancy Bids
- Terms of Reference and Proposal
- Estimation of Consultancy Fees (WB/ADB Guidelines)
- Code of Conducts

PROJECT APPRAISAL TECHNIQUES*

- Technical/Financial/ /Environmental criteria

FINANCIAL ANALYSIS*

- Capital and Operation costs
- Projections of costs and revenues

- Financial viability
- Debt servicing
- Tariff and revenues
- Income and expenditure statements
- Project balance sheets
- Rate of returns

SOCIAL COST BENEFITS ANALYSIS*

- Rationale for SCBA
- UNIDO Approach

PROJECT ORGANISATION

- Definition
- Types and Advantages
- Project Team and Team Members
- Human Resources Development and Management

PROJECT MANAGEMENT

- Planning and control
- Development of project network
- Work Break Down Structure
- Project Schedules
- PERT & CPM
- Project Monitoring and Evaluation
- Environmental care
- Safety

PROJECT MONITORING TOOLS

- PRIMAVERA**
- Management information systems

Additional guest Lectures by Project Managers and Professionals shall be arranged on Saturdays.

Student have to review a development / infrastructure project of his/ her choice. The review shall be presented in the following format:

Project Description and components
Project stages and Life Cycle
Project Organization
Details of Techno-Economic Feasibility
Project Schedules
Work Break Down Structure and MIS

EP25: ENVIRONMENTAL IMPACT ASSESSMENT LAB

T/L : 8/wk, Int:150, Ext: Nil, Total: 150,End Exam: Viva- voce, Cr : 6

The Studio Exercise

(i) To prepare a baseline environmental profile based on one season environmental information
(ii) To identify the probable impacts due to the project proposal and their significance.
(iii) To develop environmental management plan for the area.

Information collected from various primary and secondary sources.

The following areas have been identified as significant importance of study:

a) Land and Estuary Environment
b) Marine Ecology
c) Socio – Economic Environment

Urban Environmental Planning Programme for a city.

- Socio-economic
- Air environment
- Water-environment
- Noise-environment
- Industrial environment
- Resource environment

A. Field Studies and Analysis

1. *Analysis of Land-use and activity patterns*:

An activity intensity and concentration analysis for different urban/ environmental sub-systems such as industry, transportation, housing/ habitat (including squatter settlements), water supply, sewerage, solid waste and energy sector will be done in a multi-face interaction framework. This analysis will precede an environmental land use analysis.

2. *Industrial Activity Analysis:*

A more focussed analysis in terms of intensity of activity, mix of industries, pollution contribution, employment generation will be analysed to assess the environmental impact of industries in the region.

3. *Transportation Activity Analysis:*

Among the contributors to air pollution, Transport sector has gained significance in the recent past. The problems of vehicular pollution is expected to be much higher in the industrial parts of urban area as many heavy and medium goods vehicles predominate. Based on a rapid volume counts and directional movement surveys, an assessment, through appropriate modeling, is made to estimate ambient air quality and also to estimate transport sectors contribution.

4. *Environmental Infrastructure Facilities: Status and trends*

Water and waste water analysis in terms coverage, quality and source/disposal practices will be analysed to establish the status of water environment in the regions of study.

5. *Socio-economic Analysis:*

Habitat, population living in various environmental zones, level of exposure to environmental risk, health impacts, preventive and curative practices adopted by people are analysed to assess the level of risk on the one hand and to understand peoples coping strategies to mitigate environmental stress on the other.

Part –II: Evolution of Preventive/ Mitigative and Resource Conservation/ augmentation measures:

Based on sectoral analysis, a comprehensive problem statement and mitigative measures shall be evolved.

Wherever possible, conservation and augmentation of natural resources like water, land etc shall be integrated with the mitigative measures.

Thus, an integrated analysis will help us, on the one hand, to know the process of urban environmental degradation, and on the other, a suitable environmental planning effort can be made to mitigate the existing problems in the study area.

SEMESTER THREE

EP31 : SUSTAINABLE DEVELOPMENT AND BIODIVERSITY MANAGEMENT

T/L : 4/wk, Int:30, Ext: 70, Total: 100,End Exam: 3Hrs, Cr : 3

Systems Diversity.
Species Concept & Inventory.
Habitats & Systems Change.
Use Of Bioresources.
Valuing Biodiversity.
Conservation.
National & International Policies & Instruments.
Assistance & Aid.
Biodiversity Convention., Associated Inputs
Biodiversity Planning.
Costing Targets.
Agro & Forestry Systems/Forests Interface.
Monitoring Systems.
Biosphere World Views.

EP32: ENVIRONMENTAL LAW AND POLICY

T/L : 3/wk, Int:30, Ext: 70, Total: 100,End Exam: 3Hrs, Cr : 3

Introduction
Introduction to Law (Indian Constitution., Evolution of Environmental Laws in India.)
Law of Torts, the first Environmental Law.
Seminar on Air, Water and EP Acts. (A critical appraisal.)
Seminar on Forest and Wildlife Act.

PILs and Writs as a tool of pollution control.

Some important international environmental laws.

From Stockholm to Rio - History of environmental policy in world and in India.

Environment versus Development (Different approaches and analysis.)

Seminar on Alternative development paradigms for environment friendly, that is sustainable growth. (Presentation of live cases.)

EP33: REMOTE SENSING AND GEOGRAPHIC INFOMRATION SYSTEMS – II

T/L : 5/wk, Int:30, Ext: 70, Total: 100,End Exam: 3Hrs, Cr : 3

Introduction to GIS: What is GIS and its applications?; GIS as an Integrating Technology; GIS Terminology; GIS- a generic definition; Information System.

Components of GIS: Computer hardware; GIS software modules; Data Input; Data Storage and Database management; Data Output and Presentation; Organizational Aspects of GIS; Representation of Spatial and non-spatial data in GIS.

Data base management system and file structure: Data input and editing subsystem; Collect and/or processes spatial data; automated editing and verification; geo-coding; Data reporting subsystem; output form spatial models in tabular or map form.

Vector and Raster Data structure: Point; Lines and polygon; Flat files and spreadsheets; Hierarchical data structure; Relational database structures; Hands on practical exercise on data and file structures

Thematic information Extraction: Supervised classification – Baye's minimum – risk classifier; Mahalnobi's distance; Bhattacharya distance; parallelepiped classification – cluster building algorithm; Iso-data algorithm change detection – The nature of change detection; change; Detection algorithms; Interpretation of satellite imagery (Land use mapping).

Spatial data analysis: Integrated Data analysis of spatial and attribute Data; Attribute query; spatial query; retrieval; reclassification; multi layer operations (arithmetical; logical; conditional)

Map Editing: Editing of the features of maps – hand-on using GIS software.

Integration of spatial and non-spatial data base system: Statistical data analysis integrating to map- hands on practical; Map visualization - hands on practical using GIS software.

Map Analysis: Joining statistical data to map, Overlay, Query building etc - hands-on using GIS.

Network analysis: Root analysis; path finding; dynamic segmentation; location allocation; supply and demand; accessibility; spatial interaction; gravity modeling.

Digital Terrain Modeling: Slope; aspects; flow direction; flow accumulation; watershed; stream network; finding sink depth; Decision analysis (Query building; buffer; overlay etc.) – hands on practical application of GIS.

EP34: URABN DISASTER MANAGEMENT

T/L: 4/wk, Int: 30, Ext: 70, Total: 100, End Exam: 3Hrs, Cr: 4

Introduction to the concept of disaster management and mitigation.
Trend in urban development and challenges before urban administrators in risk reduction.
Natural disaster : Nature, causes, impact.
Hazard and vulnerability assessment, concepts, tools and techniques.
Pre-disaster mitigation and protection of lifelines and critical facilities against natural hazards.
Concepts and overview of technological hazards at the city level.
Major accident hazards in industries, storages and ports.
Safety management system: Strategies for implementation.
Fire safety at the city level.
Emergency planning, preparedness and response at the city level.
Principles and methods of community based approaches for urban disaster management.
Community based disaster management practice: Concepts and Cases
Strategy for Building community capability in disaster mitigation.
Education and training on mitigation and emergency planning.

EP35: ENVIRONMENTAL DESIGN

T/L: 8/wk, Int:150, Ext: Nil, Total: 150,End Exam: : Viva- voce. Cr: 6

A Code of Humane Habitat.
Concepts of City Design.
Streets and Public Spaces.
Good City Form.
Theories of Urban Design.
Human Behaviour and Urban Setting.
Planning Standards.
Land use, Transportation and Built-form Interface.
Built-form and Development Controls translate.
Landscaping and Environmental Design.
Participatory Design Process.

SEMESTER FOUR

EP41: PROFESSIONAL PRACTICES FOR PLANNERS

T/L: 4/wk, Int: 30, Ext: 70, Total: 100, End Exam: : 3hrs Cr : 4

General overview of the Planning profession, fields, markets and players at local, regional, national and International level

Scope of Work for Planners in:

- Engineering and Consultancy
- Non-Government Organizations / CBOs
- Bi- lateral and Multi-lateral organizations
- Real Estate or Project Management Offices

Academic Research Organizations

Project Development, Consultancy Proposals, Terms of Reference, Tenders for Government, Non Government and Multi-lateral agencies

Concept of Logical Framework (Log –frame) Analysis

Professional Service cost estimations, rate, rules of GO and Multi-lateral agencies etc.

Hands-on: LFA and Preparation of Technical and Financial Proposal for a hypothetical case project

Contracts, Negotiation, Remuneration

Project Monitoring and Human Resources Management

EP42: DISSERTATION

T/L: 20/wk, Int: 200, Ext: 200, Total: 400,End Exam: Viva- voce. Cr: 10

Individual projects are undertaken on environment related topics.

Thesis/Dissertation/Project work

1. Student has to start Thesis/Dissertation/Project work in III Semester itself and has to complete by the end of the IV Semester. The Thesis/Dissertation/Project work is evaluated through defence and Viva-Voce examination with one External Examiner nominated by the University, Head of the Department, Chairman Board of Studies and Research Guide(s).
2. The Viva-Voce for the labs/design projects shall be held with course instructor and one external member from academic institution/industry/R&D organization.

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- Energy analysis and policy (Munisinghi)
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